

In the Claims

The following listing of claims will replace all prior versions and listings of claims:

1. (Previously presented) A method for dynamically managing port and network addresses for a first network using at least one dynamic port management (DPM) driver and a DPM server, the DPM driver being installed on a first node of the first network and the DPM server being installed on a gateway module of the first network, the first network using a first type of network address for its internal uses and having one or more network addresses of a second type for communicating with a second node outside of the first network, the method comprising:

obtaining a first port for an application session, the application session requiring communication with the second node;

exchanging information between the DPM driver and the DPM server for reserving a network address of the second type and, if the first port is replaceable, for dynamically assigning a second port;

using the network address of the second type and the dynamically assigned second port for completing the communications of the application session,

wherein the information exchanged between the DPM driver and the DPM server indicates a network address and port for the second node;;

reconciling two separate application sessions requesting the use of the same reserved network address of the second type and the first port while at least the first port associated with one of the application sessions is not replaceable; and

recognizing, by the DPM server, data packets received for the two application sessions if both request the use of the first port, while neither of which is replaceable.

2. (Original) The method of claim 1 wherein the DPM driver uses a first network address of the first type, and the DPM server uses a predetermined port and a second network address of the first type for information exchanged between the DPM driver and the DPM server.

3. (Original) The method of claim 1 wherein the step of exchanging further comprises detecting, by the DPM driver, whether the first port for the application session is replaceable.

4. (Original) The method of claim 1 wherein the step of exchanging further comprises: checking whether the first port is replaceable by the DPM server; and extracting the network address and port for the second node from a data segment of at least one packet sent by the DPM driver to the DPM server.

5. (Original) The method of claim 1 wherein the step of using further comprises changing, by the DPM driver, the network address of the second node and its port for the application session to the second network address of the first type and a predetermined port of the gateway for one or more packets of the application session.

6. (Original) The method of claim 1 wherein the step of using further comprises: including, by the DPM server, the network address and port for the second node as a destination network address and destination port for one or more data packets of the application session initiated by the first node; and assigning the network address of the second type and the first port or the second port if the first port is replaceable as a source network address and source port for the data packets of the application session initiated by the first node.

7. (Original) The method of claim 1 further comprising updating a look-up table indicating a one-to-one relationship between the reserved network address associated with either the first port or the second port if the first port is replaced by the second port and the first network address of the first type associated with the first port.

8. (Canceled)

9. (Canceled)

10. (Previously presented) The method of claim 1 wherein the step of recognizing uses the network address and port for the second node to distinguish each application session.

11. (Original) The method of claim 1 wherein the DPM driver responds to a request from the application session inquiring the network address and port used by the application session with the reserved network address of the second type and the dynamically assigned second port used by the DPM server if the first port is replaced by the second port.

12. (Previously presented) A computer program for dynamically managing port and network addresses for a first network using at least one dynamic port management (DPM) driver and a DPM server, the DPM driver installed on a computer of the first network and the DPM server installed on a gateway module of the first network, the first network using a plurality of unregistered network address for its internal uses and having one or more registered network addresses for communicating with computers outside of the first network, the computer program comprising:

instructions for obtaining a first port from the DPM driver for an application session, the application session communicating with at least one computer outside of the first network;

instructions for exchanging information between the DPM driver and the DPM server for reserving a registered network address and, if the first port is replaceable, for dynamically assigning a second port; and

instructions for using the reserved registered network address and the dynamically assigned second port for completing communications of the application session,

instructions for recognizing, by the DPM server, data packets received for two separate application sessions requesting the use of the same reserved network address and the first port while neither of which is replaceable by using the network address and port for the computer outside of the first network to distinguish each application session;

wherein the information exchanged between the DPM driver and the DPM server indicates a network address and port for the computer outside of the first network communicating with the application session.

13. (Original) The computer program of claim 12 wherein the DPM driver uses a first unregistered network address, and the DPM server uses a second unregistered network address and a predetermined port for communications between the DPM driver and the DPM server.

14. (Original) The computer program of claim 12 further comprising instructions for updating a look-up table indicating a one-to-one relationship between the reserved registered network address associated with either the first port or the second port if the first port is replaced and the first unregistered network address associated with the first port.

15. (Original) The computer program of claim 12 wherein the instructions for exchanging further comprises:

instructions for checking whether the first port is replaceable; and

instructions for extracting the network address and port for the computer outside of the first network from at least one packet used for exchanging information between the DPM driver and the DPM server.

16. (Original) The computer program of claim 12 wherein the instructions for using further comprises:

instructions for including the network address and port for the computer outside of the first network as a destination network address and destination port for at least one data packet of the application session initiated by the computer having the DPM driver installed thereon; and

instructions for assigning the reserved network address and, if the first port is replaceable, the second port as a source network address and source port for the data packet.

17. (Original) The computer program of claim 12 further comprising instructions for reconciling two separate application sessions requesting the use of the same reserved network address and the first port while at least the first port associated with one of the application sessions is not replaceable.

18. (Canceled)

19. (Original) The computer program of claim 17 wherein the DPM driver responds to a request from the application session inquiring the network address and port used by the application session with the reserved registered network address and the dynamically assigned second port used by the DPM server if the first port is replaced by the second port.

20. (Original) A method for dynamically managing port and network addresses for a first network using at least one dynamic port management (DPM) driver and a DPM server, the DPM driver installed on a computer of the first network and the DPM server installed on a gateway module of the first network, the first network using a plurality of unregistered network addresses for its internal use and having one or more registered network addresses for communicating with computers outside of the first network, the method comprising:

obtaining a first port for an application session, the application session communicating with at least one computer outside of the first network;

reserving a registered network address by exchanging information between the DPM driver and the DPM server;

detecting whether the first port is replaceable;

dynamically assigning a second port to replace the first port for the application session if the first port is replaceable;

extracting the network address and port for the computer outside of the first network from at least one packet used for exchanging information between the DPM driver and the DPM server;

including the network address and port for the computer outside of the first network as a destination network address and destination port for at least one data packet of the application session initiated by the computer of the first network;

assigning the reserved network address and either the first port or, if the first port is replaceable, the second port as a source network address and source port for the data packet; and

reconciling two separate application sessions requesting the use of the same reserved network address and the first port while at least the first port associated with one of the application sessions is not replaceable by using the network address and the port for the computer outside of the first network to distinguish each application session.

21. (Original) The method of claim 20 further comprising using a look-up table indicating a one-to-one relationship between the reserved registered network address associated with either the first port or the second port if the first port is replaced and the first unregistered network address associated with the first port.

22. (Canceled)

23. (Original) The method of claim 20 further comprising reconciling two separate application sessions requesting the use of the same reserved network address and the first port while the first port associated with at least one of the application sessions is by using the replaced port to differentiate the application sessions.

24. (Original) The method of claim 20 wherein the DPM driver responds to a request from the application session inquiring the network address and port used by the application session with the reserved registered network address and the dynamically assigned second port used by the DPM server if the first port is replaced by the second port.

25. (Canceled).

26. (Canceled).